

Claims

1. Catalyst for water electrolysis, comprising iridium oxide and an inorganic oxide, wherein the inorganic oxide has a BET surface area in the range of 50 to 400 m<sup>2</sup>/g and is present in a quantity of less than 20 wt.% based on the total weight of the catalyst.  
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2. Catalyst according to claim 1, further comprising ruthenium oxide in an amount resulting in an Ir / Ru - atomic ratio in the range of 4 / 1 to 1 / 4.  
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3. Catalyst according to claim 1 or 2, wherein the inorganic oxide is selected from the group of titania (TiO<sub>2</sub>), silica (SiO<sub>2</sub>), alumina (Al<sub>2</sub>O<sub>3</sub>), zirconia (ZrO<sub>2</sub>), tin dioxide (SnO<sub>2</sub>), ceria, niobium pentoxide (Nb<sub>2</sub>O<sub>5</sub>) tantalum pentoxide (Ta<sub>2</sub>O<sub>5</sub>) and/or combinations thereof.  
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4. Catalyst according to one of claims 1 to 3, wherein the water solubility of the inorganic oxide (as determined according to EN ISO 787, part 8) is lower than 0,15 g/l, preferably lower than 0,05 g/l at 20 °C.  
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5. Catalyst according to one of claims 1 to 4, wherein the iridium oxide comprises iridium(IV)-oxide, iridium(III)-oxide and/or mixtures thereof.
6. Process for manufacture of the catalyst according to one of the claims 1 to 4 comprising the steps:  
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  - a) dissolving the iridium and optionally the ruthenium precursor compound in the presence of an inorganic oxide in an aqueous solution and
  - b) precipitating the iridium oxide (optionally in combination with the ruthenium oxide) by adjusting the pH of the mixture in the range of 6 to  
3010,
  - c) separating and drying the catalyst,
  - d) heat treating the catalyst at temperatures in the range of 300 to 800 °C.

7. Use of the catalyst according to one of the claims 1 to 4 as anode catalysts in electrodes, catalyst-coated membranes (CCMs) and membrane-electrode-assemblies (MEAs) for PEM water electrolyzers.

5 8. Use of the catalyst according to one of the claims 1 to 4 in regenerative fuel cells (RFC), sensors, electrolyzers and other electrochemical devices.

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